IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Wang
Appl. No.	:	10/624,728
Filed	:	July 21, 2003
For	:	DUAL CHAMBER VACUUM PROCESSING SYSTEM
Examiner	:	Rudy Zervigon
Group Art Unit	:	1763
Confirmation No.	:	7176

ON APPEAL TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPELLANT'S BRIEF

Mail Stop Appeal Brief -- Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This Appeal Brief relates to an appeal to the Board of Patent Appeals and Interferences of the final rejection set forth in a Final Office Action mailed November 3, 2006 in the above-captioned application.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is the assignee of this application, Axcelis Technologies, Inc.

II. RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any related appeals or interferences.

III. STATUS OF THE CLAIMS

The present application was originally filed with Claims 1-17. Claims 14-17 were cancelled in an amendment filed in response to a restriction requirement. In the same

amendment, Claims 2 and 13 were cancelled and Claims 18-25 were added. In a subsequent response dated August 11, 2006 before the Final Office Action, Applicant cancelled Claims 1 and 3-11. However, the Examiner did not enter these cancellations in the ensuing Final Office Action and instead treated Claims 1, 3-12 and 18-25 as pending. Because the Examiner never explained or commented on his refusal to enter the cancellations, it is believed that the failure to enter these amendments was merely an oversight on the part of the Examiner. The Final Office Action mailed November 3, 2006 rejected Claims 1, 3-12 and 18-25, which final rejection was affirmed by an Advisory Action dated January 23, 2007. Accordingly, only Claims 12 and 18-25 are the subject of this appeal, despite the fact that Claims 1 and 3-11 are additionally pending. All of the pending claims are attached hereto as Appendix A.

IV. STATUS OF AMENDMENTS

Appellants submit an amendment (attached hereto as a separate paper) to cancel Claims 1 and 3-11. Appellant's cancellation of Claims 1 and 3-11 in an amendment previously filed in response to an Office Action before the Final Office Action has not been entered. As the Examiner has never provided a basis for his failure to enter this amendment, Applicant's arguments herein treat these claims as having already been canceled. Further, the cancellation of Claims 1 and 3-11 does not alter the scope of the remaining pending claims and reduces issues on appeal. As such, Appellant respectfully requests that the cancellation of Claims 1 and 3-11 be entered prior to review of this appeal by the Board. The claims as they were finally rejected are attached hereto as Appendix A. The claims as proposed to be amended, with Claims 1 and 3-11 cancelled, are attached hereto as Appendix B.

V. SUMMARY OF THE INVENTION

The present invention, as recited by independent Claim 12, relates generally to dual chamber vacuum processing systems for processing semiconductor wafers and other substrates, and more particularly, to the sharing of hardware resources in such systems. By sharing components between the chambers, the total cost of the system can be reduced without significantly adversely affecting wafer throughput. Specification at ¶ [0002] – [0003].

A system that is exemplary of prior art (e.g., the Cox patents discussed below) dual chamber vacuum processing systems provides two processing chambers and two vacuum pumps. One of the pumps is a pump-down pump for evacuating the chamber prior to processing, and the

other pump is a process pump for evacuating the chamber during processing. In operation, while one of the chambers processes a substrate, the other chamber is vented, unloaded of a processed substrate, loaded with a fresh substrate, and pumped down. If all of these overhead operations can be performed while processing is occurring in the first chamber, the processing apparatus can be switched to the other chamber immediately after the first chamber is finished processing. In such systems, there is no "overhead" time, in which processing is not occurring in one of the chambers. Specification at ¶ [0004] – [0006].

To achieve this "zero overhead" operating condition, however, two vacuum pumps are usually required, in addition to at least four isolation valves and a complex system of vacuum lines. These components, especially the vacuum pumps, can be relatively expensive. Further, the pump-down pump is not fully utilized, because the actual pump-down process constitutes only a relatively small proportion of the total overhead time. Specification at ¶ [0007].

In addition, the Applicant discovered that, in practice, the ideal "zero overhead" operating condition of the prior art (e.g., the Cox patents) is not always achieved because, in some situations, the preparation phase takes longer than the processing phase. This results in a significant time gap between the end of processing in one chamber and the beginning of subsequent overhead tasks therein, which in turn reduces wafer throughput. Specification at ¶ [0022].

In view of the practical reality that zero overhead is sometimes not feasible, embodiments of the present application discard the goal of zero overhead and alleviate some of the aforementioned equipment expenses by providing a dual chamber vacuum processing system that eliminates the need for one of the vacuum pumps and two of the isolation valves in the previously described system. With reference to Figures 2A and 4, during the processing phase 102 of the first chamber 60, the preparation phase 92 of the second chamber 62 is carried out. As shown, the preparation phase 92 includes venting, unloading, and reloading the chamber with a new substrate. Once the processing phase 102 is completed in the first chamber 60, the chambers can transition to their respective opposite phases by closing the isolation valve 70 of the first vacuum line 66 and opening the isolation valve 72 of the second vacuum line 68, so that pump 64 communicates with the second chamber 62. The processing phase can then begin in the second chamber 62 by pumping down and processing in the second chamber 62. Thus, only one

chamber is pumped at a time, and a single pump can serve this function. Specification at ¶ [0026].

During the processing phase 102 in the second chamber 62, the preparation phase is carried out in the first chamber 60 by venting, unloading, and reloading the chamber 60 with a new substrate. By the time the processing phase 102 is completed in the second chamber 62, the preparation phase 92 will be completed in the first chamber 60. The chambers can then be transitioned again and the phases can be repeated. Specification at ¶ [0027].

The appealed claims reflect the disclosed invention. Each of the appealed claims recites a computer configured to control a pump and a robot to effect pump-down and subsequent process pumping of one of the chambers during simultaneous venting, workpiece removal and workpiece reloading of the other of the chambers, such that said pump-down pumping of one of the chambers and said venting of the other of the chambers begin at substantially the same time. Compared to the aforementioned prior art, the claimed configuration sacrifices some time-efficiency and wafer throughput in order to achieve a reduction in equipment costs (especially the need for only one pump) and a simpler overall design for a dual chamber processing system in which both chambers share the same hardware resources.

VI. LISTING OF GROUNDS OF REJECTION BEFORE THE BOARD

A. Rejections Under § 102

Claims 12 and 18-25 stand rejected under 35 U.S.C. § 102(g) and 35 U.S.C. § 102(f) as being directed to the same invention as commonly assigned U.S. Patent Nos. 6,273,956 and 6,228,773 to Cox ("Cox '956" and "Cox '773").

B. Rejection Under Double Patenting

Claims 12 and 18-25 stand rejected on the ground of nonstatutory obviousness-type double-patenting as being unpatentable over Claims 1-28 of Cox '956 and over Claims 1-28 of Cox '773.

C. Rejections Under § 103

Claims 12 and 18-25 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Cox '773 in view of U.S. Patent No. 6,802,933 to Khan et al. ("Khan").

VII. GROUPING OF CLAIMS

Claims 12 and 18-25 stand or fall together. Each of Claims 12 and 18-25 recites a "computer configured to control the pump and the robot to effect pump-down and subsequent process pumping of one of the chambers during simultaneous venting, workpiece removal and workpiece reloading of the other of the chambers, such that said pump-down pumping of one of the chambers and said venting of the other of the chambers begin at substantially the same time."

Appellant reserves the right to separately argue, in subsequent continuing applications, the patentability of other features not addressed herein.

VIII. APPELLANT'S ARGUMENT

A. Rejections Under § 102

1. Section 102(f)

a. Legal Standard for Rejections Under § 102(f)

Under § 102(f), a person is not entitled to a patent if "he did not himself invent the subject matter sought to be patented." According to M.P.E.P. § 2137, a § 102(f) rejection is proper "[w]here it can be shown that an applicant 'derived' an invention from another." Derivation in turn requires (a) complete conception by another and (b) communication of that conception to the alleged deriver. *See* M.P.E.P. § 2137 ("Derivation requires complete conception by another and communication of that conception by any means to the party charged with derivation prior to any date on which it can be shown that the one charged with derivation possessed knowledge of the invention."). Moreover, the communication element is only satisfied if the communication is "sufficient to enable one of ordinary skill in the art to construct and successfully operate the invention." M.P.E.P. § 2137.

Further, the law entitles an applicant to a presumption that he is the proper inventor until there is proof that he derived the invention: "The Examiner must presume that the applicants are the proper inventors unless there is proof that another made the invention and that applicant derived the invention from the true inventor." M.P.E.P. § 706.02(g).

b. Final Office Action Ignores The Legal Standard

As a preliminary matter, it is not even clear whether the Examiner intends to reject the claims under § 102(f). The Final Office Action includes the somewhat vague statement "the issue of priority under 35 U.S.C. § 102(b) and possibly 35 U.S.C. § 102(f) of this single invention must be resolved." *See* page 2 (emphasis added).

Assuming this does constitute a § 102(f) rejection, the rejection is improper because the Final Office Action completely ignores the legal standard for a rejection under § 102(f). The Final Office Action ignores the presumption favoring the Applicant, does not provide any proof that Cox conceived the claimed invention, and also fails to show any proof that Cox communicated such a conception to the Applicant. Nor does the Final Office Action make any attempt to explain how any communication of the disclosure of the Cox patents (the two Cox patents contain identical specifications) to the Applicant would have been sufficient to enable a skilled artisan to construct and successfully operate the dual chamber processing system recited in Claim 12, in which a "computer configured to control the pump and the robot to effect pump-down and subsequent process pumping of one of the chambers during simultaneous venting, workpiece removal and workpiece reloading of the other of the chambers, such that said pump-down pumping of one of the chambers and said venting of the other of the chambers begin at substantially the same time" (hereinafter the "computer configured to" limitation).

Indeed, a hypothetical disclosure of the full subject matter of the Cox patents could not constitute an enabling communication of the "computer configured to" limitation in Claim 12, as essentially admitted by the Final Office Action. In rejecting the claims under § 103, the Final Office Action admits that the Cox patents do not teach the "computer configured to" limitation of the last subparagraph of Claim 12. *See* Final Office Action, p. 9. Thus, the Final Office Action itself curtails any argument that a hypothetical disclosure to Applicant of the disclosure of the Cox patents could constitute a communication of a complete conception of the claimed invention.

In support of its rejections under § 102(f), the Final Office Action points to Figure 15 of the Cox patents, stating that "[e]lements cited in each Figure 15 of the § 102 references correspond directly to Applicant's invention of Figure 2a of the instant application." Final Office Action, p. 11. However, any alleged similarity of the figures simply has no place in the § 102(f) analysis. Rejection under § 102(f) must focus on the claims. Perceived similarities between the

figures of the present application and the figures of the Cox patents are entirely irrelevant to the question of whether Applicant derived the underlying claimed invention from Cox.

c. Claims 12 and 18-25 Are Neither Anticipated Nor Rendered Obvious by the Cited References

The Examiner's § 102(f) rejection is premised upon the erroneous conclusion that the present application claims the same invention as Cox. To the contrary, even leaving aside the differences between the claims of the Cox patents and the claims of the present application, the Cox patents cannot claim the same invention as the present application because Cox fails to teach or suggest the subject matter of the appealed claims. In particular, Cox does not disclose or remotely suggest the "computer configured to" limitation of Claim 12. Indeed, this can hardly be in dispute since the Examiner explicitly states at page 9 of the Final Office Action that Cox does not teach this limitation. For at least this reason, the Cox patents fail to disclose, much less claim, the subject matter of Claim 12 of the present application.

Indeed, Cox '773 teaches away from the "computer configured to" limitations of Claim 12 with its "zero overhead" system. Cox '773 defines "zero overhead" as conducting all overhead tasks (including pump-down pumping) in one chamber during processing in another chamber. Cox '773, col. 2, ll. 44-52 (stating that "overhead tasks" include "pumping or venting the process reactor chamber to the desired vacuum level"); col. 9, ll. 42-48 ("the overhead is near zero if all chamber 30, 32 overhead processes and robot 15 overhead processes ... are begun and completed during the same time that each chamber 30, 32 alternately and synchronously begins and completes active processing of its wafer."). Thus, Cox's "zero overhead" system requires simultaneous pumpdown pumping in one chamber and process pumping in the other chamber. Cox therefore teaches away from the recitation in Claim 12 of a "computer configured to control the pump and the robot to effect pump-down and subsequent process pumping of one of the chambers during simultaneous venting, workpiece removal and workpiece reloading of the other of the chambers."

As explained hereinabove, relative to the systems taught in the Cox patents, the claimed configuration sacrifices some time-efficiency and wafer throughput in order to achieve simplicity and a reduction in equipment costs. In further illustration of the differences between the teachings of the Cox patents and the subject matter claimed in the present application, Applicant

provides Exhibit A in Appendix C, which was originally submitted as an attachment to the Amendment of August 11, 2006. Exhibit A shows a graphical representation of tasks performed in dual processing chambers as a function of time for two embodiments of the Cox patents (Figs. 15 and 16, top two graphs) and a preferred embodiment of Applicant's Claim 12 invention (bottom graph). As can be seen in Exhibit A, both of Cox's embodiments initiate venting in one chamber at the same time as initiating process pumping in the other chamber. Both of Cox's embodiments involve simultaneous pump-down pumping in one chamber and process pumping in the other chamber. Cox's dual pump embodiment employs a dedicated pump-down pump 98, which allows process pump 96 to remain on for the entirety of each processing phase. Cox's single pump embodiment requires the pump to switch during the processing phase of one chamber to a pump-down operation of the other chamber. Cox actually teaches that the process phase in one chamber ends at about the same time as the pump-down phase ends in the other chamber.

However, the present application recognizes that Cox's overhead tasks in practice tend to last longer than the processing in the other chamber, which is why the overhead tasks in the Cox embodiments of Exhibit A terminate slightly after the corresponding process phase. In practice, Cox's method fails to achieve zero overhead because there is a significant time gap between the end of processing in one chamber and the beginning of subsequent overhead tasks therein, which in turn reduces wafer throughput. See ¶ [0007] of present Specification. Therefore, Applicant recognized that Cox's goal of zero overhead can advantageously be discarded to gain the benefit of a reduction in equipment costs (using only one pump) while process pumping during the entirety of each process phase, by modifying the sequence to conduct pump-down pumping and subsequent process pumping in one chamber during simultaneous venting, unloading and reloading in the other chamber, as shown in the third graph of Exhibit A. Thus, the configuration recited in Claim 12 goes against the teachings of the Cox patents by sacrificing some time-efficiency and wafer throughput in order to achieve simplicity and a reduction in equipment costs.

2. <u>Section 102(g)</u>

Claims 12 and 18-25 stand rejected under 35 U.S.C. § 102(g) as being directed to the same invention as the Cox patents. As stated above, Applicant is unaware of any interferences

related to the present application. Accordingly, the Final Office Action's rejection under § 102(g) constitutes an *ex parte* rejection. According to M.P.E.P. § 2138, an *ex parte* rejection of a patent claim under § 102(g) is only appropriate when "the subject matter at issue has been actually reduced to practice by another before the Applicant's invention." Moreover, filing a patent application cannot constitute an actual reduction to practice for the purposes of an *ex parte* rejection under § 102(g):

> While the filing of an application for patent is a constructive reduction to practice, the filing of an application does not in itself provide the evidence necessary to show an actual reduction to practice of any of the subject matter disclosed in the application as is necessary to provide the basis for an *ex parte* rejection under 35 U.S.C. § 102(g).

M.P.E.P. § 2138.

Thus, the Cox patents alone do not qualify as evidence of an actual reduction to practice, as required for an *ex parte* rejection under § 102(g). As the Examiner provides no evidence of an actual reduction to practice, the rejections under § 102(g) are improper. Moreover, even if the Cox patents did constitute an actual reduction to practice, they are not directed to the same invention as the presently pending claims. The Cox patents do not disclose or claim the "computer configured to" limitations of Claim 12 and therefore fail to claim the subject matter of Claims 12 and 18-25 for the reasons discussed hereinabove at Section A.1.c.

B. Double-Patenting Rejections

The Final Office Action rejects Claims 12 and 18-25 on the ground of nonstatutory obviousness-type double-patenting as being unpatentable over Claims 1-28 of Cox '956 and over Claims 1-28 of Cox '773. According to the MPEP, an obviousness-type double-patenting rejection must set forth (a) the differences between the inventions defined by the claim in the patent compared to the claim in the application and (b) the reasons why the invention defined in the claim in the application is an obvious variation of the invention defined in the claim in the patent. *See* M.P.E.P. § 804(II)(B)(1).

In accordance with the MPEP, the Final Office Action identifies the difference between the Cox patents and Claim 12 of the present application as being the Cox patents' failure to teach or claim the "computer configured to" language of Claim 12. *See* Final Office Action at p. 3. The Action asserts that "it would have been obvious to one of ordinary skill in the art at the time

the invention was made to 'program' Cox's computer as taught by Cox (Claims 1, 7, 9, 10, 13). Motivation to 'program' Cox's computer is for process automation and optimization." *See* Final Office Action at p. 3.

The Final Office Action makes nearly identical rejections based on both Cox '773 and Cox '956. However, Applicant notes that none of Claims 1, 7, 9, 10, or 13 in Cox '773 even recite a computer. Thus, the double-patenting rejection based on Cox '773 is nonsensical. Only Claims 1, 7, 9, 10, and 13 of Cox '956 even mention a computer, and the limitations in Claim 12 of the present application would not be an obvious variant of any of these claims for the reasons discussed below.

Claim 1 of Cox '956 recites a dual chamber apparatus comprising a computer "for repeatedly synchronously alternately controlling the power source application, the robot movement and the chamber processing." This claim mentions processing workpieces "in a deep vacuum," but it says nothing about pump-down pumping or process pumping, let alone the relative timing of such. Claim 1 of Cox '956 does not even remotely suggest conducting pump-down and subsequent process pumping of one of the chambers during simultaneous venting, workpiece removal and workpiece reloading of the other of the chambers, or beginning pump-down pumping in one chamber at substantially the same time as the venting in the other chamber.

Dependent Claim 7 of Cox '956 adds the limitation that "the computer is programmed such that chamber overhead time substantially does not overlap with the chamber processing time." This claim merely requires that processing in a chamber begins only after all of the overhead tasks for that chamber (*e.g.*, venting, processed workpiece unload, unprocessed workpiece load, and pump-down) are completed. Claim 7 of Cox '956 does not remotely suggest conducting pump-down and subsequent process pumping of one of the chambers during simultaneous venting, workpiece removal and workpiece reloading of the other of the chambers, or beginning pump-down pumping in one chamber at substantially the same time as the venting in the other chamber.

Dependent Claims 9 and 10 of Cox '956 add the limitation that the computer is programmed to have a robot wait time of substantially/near zero between loading an unprocessed workpiece in one of the chambers and unloading a processed workpiece in the other of the chambers. Based on the specification of Cox '956, these claims merely require that the robot does not have any unproductive wait time between the unloading of a processed workpiece from

one chamber and the loading of an unprocessed workpiece in another chamber. Note that the claim does not necessarily require a substantially zero lag time between the unloading of the processed workpiece and the loading of the unprocessed workpiece. Cox '956 makes it clear that the reference to "zero wait time" may actually encompass time associated with certain events, such as time that the robot traverses between the two chambers. *See* Cox '956, col. 13, line 34 to col. 14, line 16; Figures 17 and 18. Claims 9 and 10 of Cox '956 say nothing about pump-down pumping or process pumping, let alone the relative timing of such. Nor do they remotely suggest conducting pump-down and subsequent process pumping of one of the chambers during simultaneous venting, workpiece removal and workpiece reloading of the other of the chambers, or beginning pump-down pumping in one chamber at substantially the same time as the venting in the other chamber.

Dependent Claim 13 of Cox '956 adds the limitation that "the computer is programmed such that, alternately and synchronously, all of the odd numbered workpieces are processed in the second chamber and all of the even numbered workpieces are processed in the first chamber, but all workpieces are returned to their original slots in the single cassette." Again, this limitation says nothing about pump-down pumping or process pumping, let alone the relative timing of such. Nor does it remotely suggest conducting pump-down and subsequent process pumping of one of the chambers during simultaneous venting, workpiece removal and workpiece reloading of the other of the chambers, or beginning pump-down pumping in one chamber at substantially the same time as the venting in the other chamber.

As noted above, the Final Office Action states that motivation to "program" Cox's computer is for "process automation and optimization." With specific regard to Claims 1, 7, 9, 10, and 13 of Cox '956, even if a skilled artisan wanted to program the computer with an eye toward automating and optimizing the process of the dual chamber apparatus, there is no apparent reason why the artisan would have decided to program the computer such that (1) one chamber undergoes the steps of pump-down and subsequent process pumping while another chamber simultaneously undergoes the steps of venting, workpiece removal, and workpiece reloading; or (2) the pump-down pumping in one chamber begins at substantially the same time as the venting in the other chamber. In fact, the goal of process optimization would actually have led the skilled artisan toward Cox's express teaching of a "zero overhead" process, which, as explained above, is not encompassed by the present claims.

Regarding the double patenting rejection, the Final Office Action states:

> With respect to Applicant's arguments based on the Examiner's double patenting rejections, it was previously noted, in prior actions, the fact that *all* apparatus parts and corresponding Figure numbers claimed in the present application are *identical* to the Cox patents. As a result, a reiteration of said parts would be redundant.

Final Office Action, page 14.

Applicant disagrees. The claimed apparatus is not identical to the Cox patents. The Cox patents do not disclose a "computer configured to control the pump and the robot to effect pump-down and subsequent process pumping of one of the chambers during simultaneous venting, workpiece removal and workpiece reloading of the other of the chambers, such that said pump-down pumping of one of the chambers and said venting of the other of the chambers begin at substantially the same time." The Cox patents do indeed disclose a computer for various purposes. However, the mere disclosure of a computer and the general motivation to program the computer to achieve automation and optimization of a process does not make obvious a computer configured to control apparatus elements such that (1) one chamber undergoes the steps of pump-down and subsequent process pumping while another chamber simultaneously undergoes the steps of venting, workpiece removal, and workpiece reloading; or (2) the pump-down pumping in one chamber begins at substantially the same time as the venting in the other chamber.

C. Rejection Under § 103

Claims 12 and 18-25 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Cox '773 in view of U.S. Patent No. 6,802,933 to Khan et al. ("Khan"). As noted above, the Final Office Action recognizes that Cox '773 fails to teach the "computer configured to" limitation of Claim 12. *See* Final Office Action at p. 9. However, the Final Office Action asserts that the computer controller method of Khan discloses the subject matter of the "computer configured to" limitation of Claim 12. Moreover, the Final Office Action finds that it would have been obvious to add Khan's computer controller method to the process of Cox because: "Motivation to add Khan's computer controller method for automating Cox's above process components ... is for process automation as taught by Khan..." Final Office Action, p. 10.

This rejection is improper for at least two reasons. First, Khan does not teach the "computer configured to" limitation. Khan's mere disclosure of a computer controller for a

substrate processing system in no way suggests the "computer configured to" limitation of Claim 12, including (1) one chamber undergoing the steps of pumpdown and subsequent process pumping while another chamber simultaneously undergoes the steps of venting, workpiece removal, and workpiece reloading; and (2) the pumpdown pumping in one chamber beginning at substantially the same time has the venting in another chamber. The Cox patents also fail to disclose or suggest this limitation, for all the reasons discussed hereinabove at Section A.1.c. Thus, the Final Office Action does not point to any prior art that suggests these limitations.

Second, even if the prior art taught computer-controlled process automation of substrate processing equipment and provided a general motivation to optimize operation, that alone would not have led the skilled artisan to adopt the operational sequence recited in Claim 12. Rather, the skilled artisan would be led to the operational sequence taught in the Cox patents. The zero overhead process taught in the Cox patents is more time-efficient than the claimed operational sequence, because zero overhead means that the workpiece processing is always occurring in one of the chambers.

In contrast, the claimed invention sacrifices temporal efficiency to gain the combined advantages of (1) a reduction in the number of pumps, and (2) process pumping during the entirety of each chamber's processing phase. *See* Specification, ¶ [0022] - [0024]; Figs. 3 and 4. Thus, the general motivations for process automation and operation optimization would not have led the skilled artisan to adopt the operational sequence of the claimed invention, in which (1) one chamber undergoes the steps of pumpdown and subsequent process pumping while another chamber simultaneously undergoes the steps of venting, workpiece removal, and workpiece reloading; and (2) the pumpdown pumping in one chamber begins at substantially the same time as the venting in the other chamber.

D. Conclusion

In summary, Appellant submits that the Examiner has not shown any prior art that, either alone or in combination, teaches or suggests the "computer configured to" limitation of Claim 12. Claims 18-25 depend from Claim 12 and therefore include this limitation as well. Thus, Appellant respectfully submits that the Examiner's rejections are improper and that Claims 12 and 18-25 are allowable over the art of record.

IX. APPENDIX A

Attached hereto as Appendix A is a copy of the finally rejected claims in the present case.

X. APPENDIX B

Attached hereto as Appendix B is a copy of the claims as proposed to be amended in the present case.

XI. APPENDIX C

Attached hereto as Appendix C is a copy of Exhibit A, originally submitted in the Amendment of August 11, 2006.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: March 2, 2007

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APPENDIX A
(Claims as finally rejected)

1. A photoresist ashing system comprising two processing chambers configured for alternate operation, no more than a single pump in fluid communication with the two chambers, and a throttle valve simultaneously downstream of both chambers and upstream of the pump, the pump being configured to perform both pumpdown and process pumping of the two chambers and the throttle valve configured to regulate the pressure in both of the chambers.

2. (Canceled)

3. The system of Claim 1, wherein the single pump is a dry pump.

4. The system of Claim 1, further comprising only one isolation valve between the pump and a first one of the chambers.

5. The system of Claim 4, further comprising only one isolation valve between the pump and a second one of the chambers.

6. The system of Claim 1, wherein the chambers are adjacent to each other.

7. The system of Claim 1, wherein each chamber comprises a remote plasma applicator configured to be powered by a common power source switchable between the two chambers.

8. The system of Claim 7, wherein the power source is a microwave power source.

9. The system of Claim 7, wherein the power source is a common radio frequency power source synchronously multiplexed between the two processing chambers.

10. The system of Claim 1, wherein the processing-chambers are each configured to receive a single silicon wafer at a time, and the processing-chambers are each downstream of a plasma applicator.

11. The system of Claim 1, wherein the processing chambers are each configured to receive a single silicon wafer at a time, and the processing chambers each comprise an in situ plasma reactor.

12. A dual chamber processing system for continuously processing a plurality of workpieces comprising:

a common power source switchable between a first plasma applicator of a first chamber and a second plasma applicator of a second chamber,

the first chamber for processing a second workpiece in a vacuum to completion therein when the power source is applied thereto and switched ON,

a robot configured to remove at substantially atmospheric pressure a first workpiece from the second chamber after processing the first workpiece, the robot configured to reload the second chamber with a third workpiece to be processed while the second workpiece is being processed in the first chamber, the robot configured to remove at substantially atmospheric pressure the second workpiece from the first chamber after processing the first workpiece, the robot configured to reload the first chamber with a fourth workpiece to be processed while the third workpiece is being processed in the second chamber,

the second chamber for processing the third workpiece in a vacuum to completion therein when the power source is applied to the second plasma applicator and switched ON,

exactly one pump adapted to be in fluid communication with the first and second chambers, the pump being configured to perform both process pumping and pump-down pumping of both chambers; and

a computer configured to repeatedly synchronously and alternately control the power source application, the robot movement, the chamber processing, and the pump, the computer configured to control the pump and the robot to effect pump-down and subsequent process pumping of one of the chambers during simultaneous venting, workpiece removal and workpiece reloading of the other of the chambers, such that said pump-down pumping of one of the chambers and said venting of the other of the chambers begin at substantially the same time, and the computer being configured to open the pump to fluid communication with only one of the chambers at a time.

13-17. (Canceled)

18. The system of Claim 12, wherein the single pump is a dry pump.

19. The system of Claim 12, wherein the system further comprises only one isolation valve between the pump and the first chamber.

20. The system of Claim 19, wherein the system further comprises only one isolation valve between the pump and the second chamber.

21. The system of Claim 12, wherein the first chamber and the second chamber are adjacent to each other.

22. The system of Claim 12, wherein the power source is a microwave power source.

23. The system of Claim 12, wherein the power source is a common radio frequency power source synchronously multiplexed between the two processing chambers.

24. The system of Claim 12, wherein the chambers are each configured to receive a single silicon wafer at a time, and the chambers are each downstream of a plasma reactor.

25. The system of Claim 12, wherein the chambers are each configured to receive a single silicon wafer at a time, and the chambers each comprise an in situ plasma reactor.

APPENDIX B
(Claims as proposed to be amended)

1-11. (Canceled)

12. A dual chamber processing system for continuously processing a plurality of workpieces comprising:

a common power source switchable between a first plasma applicator of a first chamber and a second plasma applicator of a second chamber,

the first chamber for processing a second workpiece in a vacuum to completion therein when the power source is applied thereto and switched ON,

a robot configured to remove at substantially atmospheric pressure a first workpiece from the second chamber after processing the first workpiece, the robot configured to reload the second chamber with a third workpiece to be processed while the second workpiece is being processed in the first chamber, the robot configured to remove at substantially atmospheric pressure the second workpiece from the first chamber after processing the first workpiece, the robot configured to reload the first chamber with a fourth workpiece to be processed while the third workpiece is being processed in the second chamber,

the second chamber for processing the third workpiece in a vacuum to completion therein when the power source is applied to the second plasma applicator and switched ON,

exactly one pump adapted to be in fluid communication with the first and second chambers, the pump being configured to perform both process pumping and pump-down pumping of both chambers; and

a computer configured to repeatedly synchronously and alternately control the power source application, the robot movement, the chamber processing, and the pump, the computer configured to control the pump and the robot to effect pump-down and subsequent process pumping of one of the chambers during simultaneous venting, workpiece removal and workpiece reloading of the other of the chambers, such that said pump-down pumping of one of the chambers and said venting of the other of the

chambers begin at substantially the same time, and the computer being configured to open the pump to fluid communication with only one of the chambers at a time.

13-17. (Canceled)

18. The system of Claim 12, wherein the single pump is a dry pump.

19. The system of Claim 12, wherein the system further comprises only one isolation valve between the pump and the first chamber.

20. The system of Claim 19, wherein the system further comprises only one isolation valve between the pump and the second chamber.

21. The system of Claim 12, wherein the first chamber and the second chamber are adjacent to each other.

22. The system of Claim 12, wherein the power source is a microwave power source.

23. The system of Claim 12, wherein the power source is a common radio frequency power source synchronously multiplexed between the two processing chambers.

24. The system of Claim 12, wherein the chambers are each configured to receive a single silicon wafer at a time, and the chambers are each downstream of a plasma reactor.

25. The system of Claim 12, wherein the chambers are each configured to receive a single silicon wafer at a time, and the chambers each comprise an in situ plasma reactor.

APPENDIX C

(Originally submitted as Exhibit A in Amendment of August 11, 2006)

EXHIBIT A→ FOR APPL. 10/624,728
EXAMINER ZERVIGON, ART UNIT 1763

Fig. 16
Cox (two pumps)

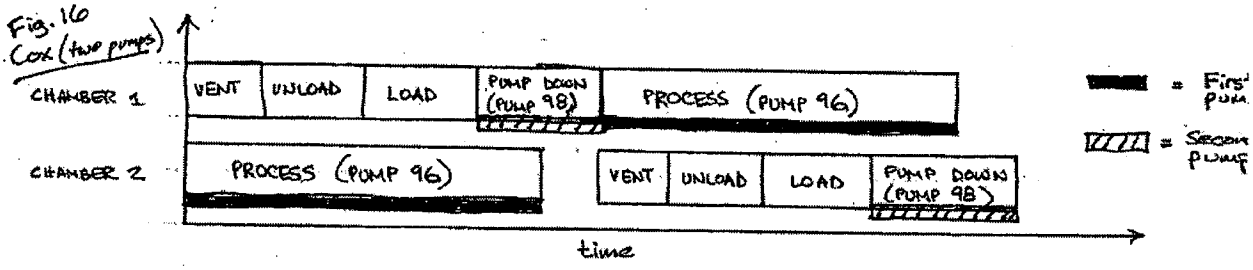
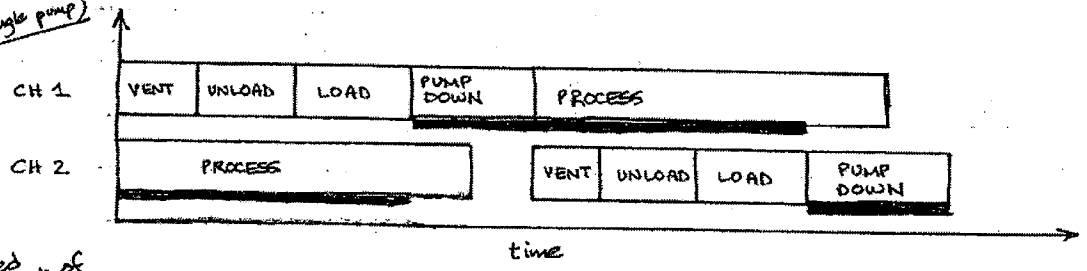
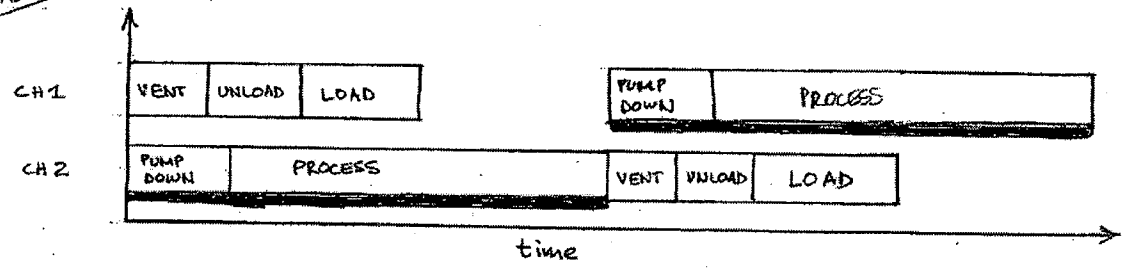


Fig. 15
Cox (single pump)



Preferred embodiment of invention



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